501.43042X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Masayuki YAMAMOTO

Serial No.:   10/659,362

Filed: September 11, 2003

For: FAILURE INFORMATION MANAGEMENT METHOD AND
MANAGEMENT SERVER IN A NETWORK EQUIPPED WITH A
STORAGE DEVICE

PETITION TO MAKE SPECIAL
UNDER 37 CFR 1.102(d) and MPEP. §708.02, VIII

Commissioner for Patents   October 1, 2004
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. Petition

Applicants hereby petition to make this application **Special**, in accordance with

37 CFR §1.102(d) and MPEP 708.02, VIII. The present invention is a new application

filed in the United States Patent and Trademark Office on September 11, 2003 and as

such has not received any examination by the Examiner.

2. Claims

Applicants hereby represent that all the claims in the present application are

directed to a single invention. If upon examination it is determined that all the claims

presented are not directed to a single invention, Applicants will make an election without

traverse as a prerequisite to the granting of special status.

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3. Search

Applicants hereby submit that a pre-examination search, a copy of which is attached, has been made by a professional searcher in the following classes and subclasses:

Class	Subclasses	Description
700/		DATA PROCESSING: GENERIC CONTROL SYSTEMS OR SPECIFIC APPLICATIONS
	9	Supervisory control
	21	Failure protection or reliability
709/		ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MULTIPLE COMPUTER OR PROCESS COORDINATING
	223	Computer network managing
	224	Computer network monitoring
714/		ERROR DETECTION/CORRECTION AND FAULT DETECTION/RECOVERY
	5	Of memory or peripheral subsystem
	42	Memory or storage device component fault
	43	Bus, I/O channel, or network path component fault
	44	Peripheral device component fault
	48	Error detection or notification
	737	Device response compared to fault dictionary/truth table

The above subclasses represent areas deemed to contain subject matter of interest to one or more of the search features. Please note that relevant references

may be classified outside of these areas. The integrity of the search is based on the records as presented by the United States Patent and Trademark Office (USPTO). No further integrity studies were performed. Also a key word search was performed on the USPTO full-text database including published U.S. patent applications.

4. Copy of References

A listing of all references found by the professional searcher was provided by a Form PTO-1449 and copies of the references and the Form PTO-1449 submitted as part of an Information Disclosure Statement (IDS) filed on September 10, 2004.

5. Detailed Discussion of the References and Distinctions Between the References and the Claims

Below is a discussion of the references uncovered by the search and cited in the Information Disclosure Statement filed on September 10, 2004 that appear to be most closely related to the subject matter encompassed by the claims of the present application, and which discussion particularly points out how Applicants' claimed subject matter is distinguishable over those references. All other references uncovered by the search and cited in the Information Disclosure Statement filed on September 10, 2004 are **not** treated in detail herein.

a. Detailed Discussion of the References

D'Errico et al. (U.S. Patent No. 6,457,139 B1), assigned to EMC Corporation, provides a *Method and Apparatus for Providing a Host Computer with Information Relating to the Mapping of Logical Volumes within an Intelligent Storage System.* Discussed is a computer system including a host computer and an intelligent storage

system. The storage system includes a plurality of physical storage devices and a mapping layer that maps plurality of logical volumes to the physical storage devices. Identifying information for the mapping is provided to the host computer. Provided, as an example, is the use of this information by the host computer for fault tolerance techniques, i.e., recovering of the storage system in the event of malfunction of disk drives (see column 14, lines 50-67 and column 15, lines 1-2).

Harris et al. (U.S. Patent Application Publication No. 2001/0047482) provides a *Distributed Storage Resource Management in a Storage Area Network*. Discussed is the management of storage resources associated with the network wherein the server manages the resources and the client directs the I/O requests over the data path and redirects them to the server upon failure condition. A volume configuration layer manages the volumes associated with the storage resources and a recovery layer manages the recovery of a failed storage device (see paragraphs 0009 and 0031).

Iwami et al. (U.S. Patent Application Publication No. 2003/0191904) provides a *Computer System Having Plural of Storage Systems*. Server accesses the virtual volume control table to retrieve virtual volumes supplied to the server via the virtualization server or virtualization switch in which the failure is detected (see paragraphs 0070, 0072, 0073 and 0092).

Arakawa et al. (U.S. Patent Application Publication No. 2003/0204597), assigned to Hitachi, Inc., provides a *Storage System Having Virtualized Resource*. The server receives failure notifications from the storage subsystem, stores it in the repository and notifies the user of the information. The information in the repository relates to device types, functions the devices can perform, association information of the devices and other information to provide virtualized resources and management (see paragraphs

0112, 0114, and 0228).

Yamamoto et al. (U.S. Patent Application Publication No. 2004/0049572), assigned to Hitachi, Ltd., provides an *Event Notification in Storage Networks*. The SAN manager includes all physical and logical connection information. The manager performs event management using trap dictionaries, topology table and discovery list in order to interpret an event message received from the device experiencing failure (see paragraphs 0050, 0056, 0057 and 0062; as well as, U.S. patent application publication 2003/0208589 which also describes the topology tables and lists).

The article entitled, "SCALAR *i*2000," provides a method of fault isolation by using advanced logic schemes

b.   Distinctions Between the References and the Claims

The present invention as recited in the claims is not taught or suggested by any of the above noted references whether taken individually or in combination with each other or in combination with any of the other references now of record.

The present invention as now recited in the claims is directed to failure notification in a system including at least one storage device, each equipped with a real volume, a virtualization device connected to the storage device by a network and managing a real volume of the storage device as a virtual volume and a management server connected to the storage device and the virtualization device by a management network according to the present invention. The management server receives a plurality of failure notifications from the storage device and the virtualization device at which a failure is detected, and associates the failure notifications based on associations managed by the virtualization device between

the real volume and the virtual volume. Thereafter, results in which the failure notifications are associated are output.

The above described features of the present invention, particularly the provision of associating the failure notifications based on associations managed by the virtualization device between the real volume and the virtual volume, and outputting results in which the failure notifications are associated are not taught or suggested by any of the references of record whether taken individually or in combination with each other.

6. Fee (37 C.F.R. 1.17(i))

The fee required by 37 C.F.R. § 1.17(i) is to be paid by:

[X]   the Credit Card Payment Form (attached) for $130.00.

[   ]   charging Account _____ the sum of $130.00.

A duplicate of this petition is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (501.43042X00).

Respectfully submitted,

Antonelli, Terry, Stout & Kraus, LLP

Carl I. Brundidge
Registration No. 29,621

CIB/jdc
Enclosures

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May 25, 2004

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RE: PATENTABILITY SEARCH FOR A FAILURE INFORMATION
MANAGEMENT METHOD AND MANAGEMENT SERVER IN A
NETWORK
Your File: 340300120US01
Our Docket: PSP-1041422

Dear Ms. Otsuka:

In accordance with your request, we have conducted a patentability search on the above-identified subject matter.

Enclosed with this report are copies of the search results and your disclosure materials. If after reviewing the results, you feel that the search feature (or specific search elements), the field of search, or results are not commensurate with your original request, or you would like to extend the search into additional areas, please contact us.

Sincerely,

Randy W. Lacasse

Enclosures
RWL:NC:blf
s04/psp1041422

CONFIDENTIAL
(Patentability Search)

I. SEARCH FEATURE

In a system including: at least one storage device, each equipped with a real volume; a virtualization device connected to said at least one storage device by way of a network and managing a real volume of said at least one storage device as a virtual volume and a management server connected to said at least one storage device and said virtualization device by way of a management network;

a failure notification receiving method comprising:

a failure notification step in which said management server receives a plurality of failure notifications from said at least one storage device and said virtualization device at which a failure is detected;

an associating step in which said management server associates said plurality of failure notifications based on associations managed by said virtualization device between said real volume and said virtual volume; and

a failure message outputting step for outputting results in which said plurality of failure notifications are associated.

II. FIELD OF SEARCH

The search of the above features was conducted in the following areas:

A. Classification search

Class	Subclasses	Description
700/		DATA PROCESSING: GENERIC CONTROL SYSTEMS OR SPECIFIC APPLICATIONS
	9	.Supervisory control
	21	..Failure protection or reliability
709/		ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MULTIPLE COMPUTER OR PROCESS COORDINATING
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B.   Online database search
      Delphion, <http://www.delphion.com/research/>
      Espacenet, <http://gb.espacenet.com/>
      Google, <www.google.com>

III.   RESULTS OF SEARCH

A.   References developed as a result of search:

U.S. Patent No.	Inventor
6,457,139 B1	D'Errico et al.

U.S. Patent Application Publication No.	Inventor
2001/0047482	Harris et al.
2003/0191904	Iwami et al.
2003/0204597	Arakawa et al.
2003/0208589	Yamamoto
2004/0049572	Yamamoto et al.

Websites
"SCALAR *i*2000,"
<http://www.trisys.co.uk/downloads/adic/Scalar_i2000_Data_Sheet.pdf>

B.   Discussion of related references in numerical order:

The patent to D'Errico et al. (6,457,139 B1), assigned to EMC Corporation, provides for a *Method and Apparatus for Providing a Host Computer with Information Relating to the Mapping of Logical Volumes within an Intelligent Storage System*. Discussed is a computer system including a host computer and an intelligent storage system. The storage system includes a plurality of physical storage devices and a mapping layer that maps plurality of logical volumes to the physical storage devices. Identifying information for the mapping is provided to the host computer. Provided, as an example, is the use of this information by the host computer for fault tolerance techniques, i.e., recovering of the storage system in the event of malfunction of disk drives (see column 14, lines 50-67 and column 15, lines 1-2).

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The patent application publication to Yamamoto et al. (2004/0049572), assigned to Hitachi, Ltd., provides for an *Event Notification in Storage Networks*. The SAN manager includes all physical and logical connection information. The manager performs event management using trap dictionaries, topology table and discovery list in order to interpret an event message received from the device experiencing failure (see paragraphs 0050, 0056, 0057 and 0062; as well as, U.S. patent application publication 2003/0208589 which also describes the topology tables and lists).

The article entitled, "SCALAR *i*2000," provides for a method of fault isolation by using advanced logic schemes

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